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# Endovascular Reconstruction of Aortic Arch by Modified Bifurcated Stent Graft for Stanford Type A Dissection

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The authors should be congratulated for their successful management of this pathology. They displayed an ingenious and well-thought solution. As mentioned by Dr Dietrich in an editorial last year, it is now time to consider endovascular repair (EVAR) as a valid alternative for many patients with abdominal aneurysms.<sup>1</sup> However, there is still a long way to go to achieve the same goal for thoracic aneurysms, let alone arch aneurysms and dissections.

Several techniques have been described to overcome the problem of vital side branches. At this moment, selected thoracoabdominal and other suprarenal aortic aneurysms are being successfully treated with fenestrated/branched grafts in some specialized centres, or by surgical debranching in conjunction with endovascular treatment.<sup>2–6</sup> For the arch, the first possibility for total arch replacement has been surgical relocation of the supra-aortic vessels with subsequent endovascular grafting.<sup>7</sup> Branched devices have been used, but published results are limited.<sup>8</sup> This is certainly due to the relatively easy surgical adjunct technique, in comparison to the more tedious branched technique. The grafts are also not widely available.

The last challenge is the ascending aorta with its difficult anatomy, dynamics, and the presence of the coronary vessels. The first report with an approach from the right carotid was published by Chuter et al.<sup>9</sup>

These complex endovascular techniques will continue to emerge in view of the major impact of the open surgical alternative. In addition, many patients with comorbidities are rightfully refused open surgery they would most probably not survive. Nevertheless, some issues have to be raised.

Firstly, one could question the end result of the previous endovascular procedure. The indication 3 years after an acute type B dissection was an aneurysm of 7 cm. Therefore, complete exclusion should have been sought, which is often not possible in a chronic type B dissection. The second issue is the classification of this dissection: is this a type A or a complication of the endovascular treatment of the type B dissection (i.e. a retrograde dissection due to the bare stent of the used stent graft)?

In both reported cases (Chuter et al and this report), the patients did not suffer cerebral complications. I would nevertheless argue that inserting a 22–24 French sheath in the sole carotid vessel (after carotid–carotid bypass) is certainly not a harmful procedure.

The graft used is fairly stiff and kinking, and migration is certainly to be feared in the arch. On the other hand, probably the limb extending into the innominate artery stabilizes the whole graft. The major advantage of coming from the right carotid is the short distance between insertion and deployment and therefore much better control.

We have attempted a few thoracic arch cases with fenestrated and branched grafts. The long distance between femoral insertion and the arch or ascending deployment makes control and repositioning tedious. It is easier when insertion is required/achieved through an aortic conduit. The haemodynamics of the arch and the difficult anatomy (i.e. measuring the relative positions of the supra-aortic vessels) make designing a fenestrated/branched graft difficult. It is necessary to keep access to all targeted supra-aortic vessels, and to insert bridging stents/stent grafts in all targeted vessels. We have seen grafts twist after full

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deployment, resulting in occlusion of two left carotid arteries, although the positioning seemed perfect. One patient died from a cerebral infarct, although we recanalized the occlusion within 30 minutes; the other patient experienced no complications at all, although we did not re-open the left carotid artery.

The aortic arch and the ascending aorta will remain a challenge independent of the technique used. I do believe that these pathologies should be treated in selected centres only. This will allow for unbiased evaluation and comparison of the different techniques.

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